

## Virginia Department of Health

### Q Fever: Overview for Healthcare Providers

<b>Organism</b>	<i>Coxiella burnetii</i> : obligate intracellular bacterium, gram-negative coccobacillus which can persist in spore-like form in environment for years
<b>Reporting to Public Health</b>	Suspected or confirmed cases require <u>immediate</u> notification to the local health department (LHD). See <a href="http://www.vdh.virginia.gov/local-health-districts/">http://www.vdh.virginia.gov/local-health-districts/</a>
<b>Infectious Dose</b>	1–10 organisms
<b>Occurrence</b>	<ul style="list-style-type: none"> <li>Occurs worldwide.</li> <li>In the United States, Q fever is rare, but is likely under-recognized; 156 cases were reported in 2015. In Virginia, an average of 2.0 cases per year were reported during 2011–2015.</li> </ul>
<b>Natural Reservoir</b>	<ul style="list-style-type: none"> <li>Primarily sheep, cattle, and goats, but many other species (including cats, dogs, some wild mammals, and birds) can be infected.</li> <li>Tick vectors might be important for maintaining animal and bird reservoirs, but are not commonly associated with transmission to humans.</li> </ul>
<b>Route of Infection</b>	<ul style="list-style-type: none"> <li>Most commonly by inhalation of contaminated airborne particles from birth products, excreta or tissue. also by inhalation of contaminated airborne particles from wool or bedding of infected animals</li> <li>Laboratory exposure through infective aerosols, droplets or parenteral inoculation</li> <li>Other reported routes: inhalation of wind-borne organisms; ingestion of unpasteurized dairy products from infected animals; transmission by blood or bone marrow transfusion; sexual transmission; possibly tick-borne transmission.</li> </ul>
<b>Communicability</b>	Person-to-person transmission is extremely rare, but has occurred (e.g., during autopsy, delivery of baby).
<b>Risk factors</b>	<ul style="list-style-type: none"> <li>Working with animals (e.g., livestock farms, meat processing plants, slaughterhouses, veterinary clinics, animal research facilities), attending birth by infected animals, or living near livestock</li> <li>Consuming unpasteurized dairy products</li> <li>Handling infective laboratory specimens</li> <li>Chronic Q fever is more likely in those with valvular disease, blood vessel anomalies, immunosuppression or infections during pregnancy.</li> </ul>
<b>Case-fatality Rate</b>	<ul style="list-style-type: none"> <li>Acute Q fever: low (&lt; 2%) in untreated infections; negligible in treated infections</li> <li>Chronic Q fever endocarditis: 25% –65% if untreated, &lt;10% with appropriate treatment</li> </ul>
<b>Incubation Period</b>	<ul style="list-style-type: none"> <li>Acute Q fever: Depends on dose, but typically 2 –3 weeks (range 3–30 days)</li> <li>Chronic Q fever: months to years</li> </ul>
<b>Clinical Description</b>	<ul style="list-style-type: none"> <li>Severity varies and approximately half of infections are asymptomatic.</li> <li>Acute Q fever: nonspecific febrile illness usually accompanied by rigors, myalgia, malaise, and retrobulbar headache. GI symptoms (e.g., diarrhea, vomiting) might occur, particularly in children. Severe disease can include acute hepatitis, pneumonia and meningoencephalitis. Fever usually lasts 5-14 days but may continue for as long as 2 months. Placentitis and miscarriage possible in pregnancy.</li> <li>Chronic Q fever (occurs in &lt;5% of acute cases) : endocarditis, hepatitis, osteomyelitis, post-Q fever fatigue syndrome</li> </ul>
<b>Differential Diagnosis</b>	Variable depending on affected system

<b>Radiography</b>	<ul style="list-style-type: none"> <li>• Chest x-ray might be normal or have nonspecific abnormalities, including segmental or lobar consolidation (unilateral or bilateral), involving upper or lower lobes, or feature multiple or single opacities; pleural effusions are present in ~35% of cases.</li> <li>• Endocarditis may cause vegetative lesions on heart valve visible with echocardiography.</li> </ul>
<b>Specimen Collection and Laboratory Testing</b>	<ul style="list-style-type: none"> <li>• A serologic diagnosis of acute Q fever is made by testing paired serum (acute-phase serum collected as soon as possible after symptom onset and convalescent-phase serum collected 3–6 weeks after acute phase) to detect a 4-fold change or greater in titers.</li> <li>• A serologic diagnosis of chronic Q fever is made by detecting elevated phase I IgG antibody &gt;1:1024 (and is typically higher than phase II IgG) and an identifiable persistent focus of infection (e.g., endocarditis).</li> <li>• PCR (whole blood, serum, or tissue) can also be used to facilitate diagnosis of acute or chronic Q fever.</li> <li>• Culture is not recommended for routine diagnosis because it is difficult, time consuming, and requires Biosafety Level (BSL) 3 precautions.</li> <li>• If Q fever is suspected, notify the <a href="#">LHD</a> immediately to discuss the case and laboratory testing. Specimens may be sent to Division of Consolidated Laboratory Services (DCLS) <u>after</u> VDH approves testing. For questions about specimen collection, the DCLS Emergency Officer can be reached 24/7 at 804-335-4617.</li> </ul>
<b>Treatment</b>	<ul style="list-style-type: none"> <li>• Doxycycline is the preferred treatment for Q fever in non-pregnant adults. For details, refer to CDC's Diagnosis and Management of Q Fever — United States, 2013. MMWR 2013 (<a href="http://www.cdc.gov/mmwr/pdf/rr/rr6203.pdf">http://www.cdc.gov/mmwr/pdf/rr/rr6203.pdf</a>) and consult with package inserts.</li> <li>• Treatment is most effective at preventing severe complications if it is started within 3 days of symptom onset.</li> <li>• Treatment of acute Q fever should be initiated when Q fever is suspected and should not be withheld while laboratory testing is pending. Serologic monitoring is also recommended for patients with acute Q fever who are at high risk of developing chronic Q fever.</li> <li>• Treatment of chronic Q fever should be initiated only after diagnostic confirmation.</li> <li>• Treatment of asymptomatic patients or those who have already recovered from their infection is not usually recommended, but it might be considered for patients at high risk for developing chronic Q fever.</li> </ul>
<b>Post-Exposure Prophylaxis</b>	<ul style="list-style-type: none"> <li>• PEP following a known exposure to naturally occurring <i>C. burnetii</i> is not recommended; however, self-monitoring for symptoms and periodic serologic testing might be recommended.</li> <li>• PEP (e.g., doxycycline) following an intentional release of <i>C. burnetii</i> can be considered for those at high risk for exposure. PEP is considered effective only if administered within 8-12 days of exposure.</li> </ul>
<b>Vaccine</b>	In the United States, a vaccine is not commercially available.
<b>Infection Control</b>	<ul style="list-style-type: none"> <li>• Use Standard Precautions for all patients.</li> <li>• If splashes of infected material are anticipated (e.g., during infant delivery), a face mask and eye protection (goggles or face shield) are recommended.</li> <li>• If aerosol-generating procedures are performed, additional precautions (e.g., fit-tested N-95 respirator and goggles or a face shield for eye protection; airborne infection isolation room or private room) are recommended.</li> <li>• During autopsies, use a BSL-3 facility or use the barrier precautions of BSL-2 and the negative airflow and respiratory precautions of BSL-3.</li> </ul>